NOAA Technical Memorandum NMFS-SEFC-145

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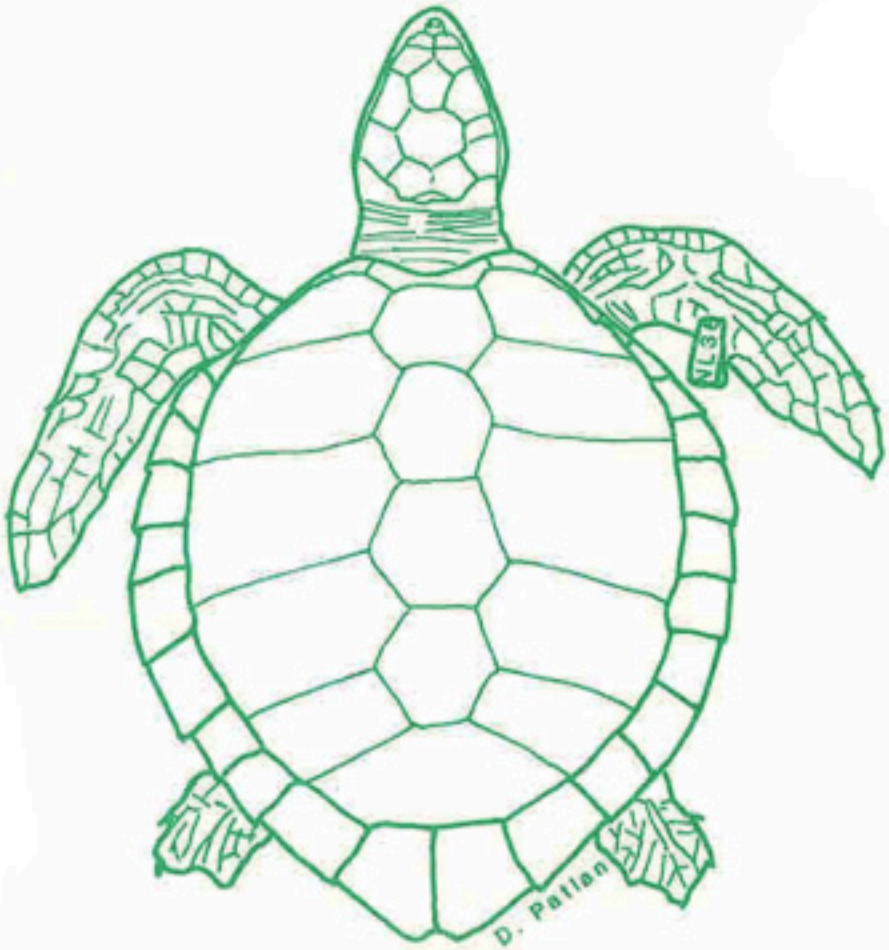

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Center
Galveston Laboratory
Galveston, Texas 77550

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THE GROWTH AND MOVEMENTS OF CAPTIVE-REARED KEMP'S RIDLEY SEA TURTLES, LEPIDOCHELYS KEMPI, FOLLOWING THEIR RELEASE IN THE GULF OF MEXICO.[1/]

BY

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SEPTEMBER 1984

NOTICE

THIS TECHNICAL MEMORANDUM SHOULD BE CITED AS FOLLOWS:

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THE GROWTH AND MOVEMENTS OF CAPTIVE-REARED KEMP'S RIDLEY SEA TURTLES, LEPIDOCHELYS KEMPI, FOLLOWING THEIR RELEASE IN THE GULF OF MEXICO. NOAA TECHNCIAL MEMORANDUM NMFS - SEFC - 145, 25 P. PLUS 3 FIGURES AND 3 TABLES.

IT CAN BE OBTAINED BY WRITING TO THE NATIONAL TECHNICAL INFORMATION SERVICE, 5258 PORT ROYAL ROAD, SPRINGFIELD, VIRGINIA 22161.

ABSTRACT

As part of an international conservation program that is attempting to save the endangered Kemp's ridley sea turtle, Lepidochelys kempi, 2,026 captive-reared L. kempi were tagged and released in the Gulf of Mexico in 1979. Fifty-four of these turtles have been recaptured. The diversity of means by which the recaptures were made indicated that many of the fishing and shrimping techniques used by man can result in the capture of this sea turtle. These recaptures have provided valuable data on the movements and the growth of young (8 to 28 months old) L. kempi in the wild. Turtles released in Florida Bay were recaptured along the Atlantic coast of the United States, suggesting that the Gulf Stream played a major role in their dispersal. However, turtles released in calmer waters near Homosassa, Florida, moved in a variety of directions, indicating that immature animals weighing 0.5 to 1.0 kg may be capable of making a transition from a planktonic to a nektonic existence in relatively calm waters. Eighteen of the recaptured turtles were weighed and/or measured. These turtles exhibited average weight gains of 5.1 g/day and average carapace length gains of 0.024 cm/day. The recaptured turtles' growth and movements indicate that captive-reared L. kempi can adapt successfully to life in the wild.

INTRODUCTION

The population of Kemp's ridley sea turtles, Lepidochelys kempi, has decreased drastically in the last 36 years. This species faces extinction unless present restoration efforts are continued. In 1947, over 40,000 nesting females were observed during a single day on this species' only major nesting beach (Hildebrand, 1963), but today only 400 to 600 females nest there in an entire season (Pritchard, 1980).

Since 1966 the Instituto Nacional de Pesca has been protecting nesting females and eggs on the nesting beach near Rancho Nuevo, Tamaulipas, Mexico. This conservation effort was expanded in 1977 when a multifaceted conservation program was initiated by the Mexican and United States Governments in an attempt to prevent the extinction of this sea turtle. This program involved: 1) the protection of the nesting females and eggs on the nesting beach, 2) an experimental imprinting project attempting to establish a breeding population of L. kempi on the Padre Island National Seashore, Texas, and 3) an experimental captive-rearing project attempting to increase the percentage of turtles that reach sexual maturity by circumventing the suspected high mortality of sea turtles in the natural environment during the first year of life.

Although this species is the subject of intense conservation work, many aspects of its life history are not clearly understood. A better understanding of its life history could enhance present conservation efforts. Most of our present knowledge about this turtle stems from data collected on the nesting beach and from reports of its occurrence in the Gulf of Mexico and the Atlantic. Both immature and mature L. Kempi have been reported throughout most areas of the Gulf of Mexico, and immature individuals have also been found along the Atlantic coasts of North America and Europe (Carr, 1956, 1980; Pritchard and Marquez, 1973). Data collected on the nesting beach show that hatchlings enter the Gulf of Mexico at an approximate weight of 18 g and an approximate carapace length of 4 cm. If they are female and survive to sexual maturity, they return to the Rancho Nuevo area to nest at a minimum weight of 32 kg and a minimum carapace length of 58 cm (Pritchard and Marquez, 1973). The movements and behavior of L. Kempi during their years of immaturity are poorly understood, although certain areas of the Gulf of Mexico and the Atlantic have had relatively high concentrations of immatures (Carr, 1980; Carr and Caldwell, 1956) Furthermore, the time required for L. Kempi to reach sexual maturity is presently speculative. Pritchard and Marquez (1973) suggested that sexual maturity is reached after 6 years. However, many of their data were obtained from

captive-reared turtles on fixed feeding schedules, and therefore may not represent the growth rate in the wild.

The experimental captive rearing-program conducted by the National Marine Fisheries Service provides the means of evaluating-captive rearing as a conservation technique for sea turtles. Additionally, this program provides an opportunity to study the movements and growth of immature L. Kempi in the wild. This program raises approximately 2,000 L. Kempi per year for the first 8 to 12 months of their lives. These turtles are then released into the Gulf of Mexico in areas where immature L. Kempi have historically been known to occur. The recapture of tagged individuals provides valuable information on the growth and movements of these immature turtles in the wild. These data may also be a reasonable indicator of the growth and movements of immature L. Kempi in the natural (noncaptive-reared) population . We report here on the recapture of turtles released during the initial year of this progam (1979) with emphasis on their movements, growth, and their survival in the wild.

METHODS AND MATERIALS

The turtles used in this captive-rearing program were hatched from eggs laid on the beach near Rancho Nuevo, Mexico. Approximately 60% of captive-reared turtles were involved in an experiment that attempted to imprint them to the beach at Padre Island National Seashore in order to start a breeding population there. Those eggs were incubated in boxes containing Padre Island sand and were transferred to Padre Island before hatching. After hatching, the turtles were allowed to crawl down the beach and into the surf before they were retrieved. The other 40% of the turtles used in this study were hatched on the nesting beach near Rancho Nuevo. All hatchlings were flown to Galveston, Texas, where they were reared for 8 to 11 months with the methods established by the National Marine Fisheries Service (Klima and McVey, 1982).

Before their release, all turtles were weighed, measured, and tagged with monel flipper tags (National Band and Tag Co. size 681)[4] on the trailing edge of the right front flipper. Each flipper tag contained an identification number and an address for reporting information about the turtle to the proper authority. Additionally, 22 turtles were equipped with radio transmitters in order to track the initial movements of the released turtles. The preliminary results of these radio-tracking experiments were discussed

by Klima and McVey (1982) and by Timko and DeBlanc (1981). Wibbels (1984) presented a detailed analysis of the movements recorded in the radio-tracking study.

Several release sites were used to investigate an optimal release site for future releases. Florida Bay and Homosassa release sites were chosen because these areas were historically known for an abundance of immature L. Kempi (Carr, 1956; Carr and Caldwell, 1956). Furthermore, these areas are considered to be ideal habitats for young sea turtles (Carr, 1956; Carr and Caldwell, 1956). Padre Island was chosen as a release site in order to reexpose the turtles to any stimulus that they may have imprinted on as hatchlings.

The release sites, release dates, average weight, and average carapace length of turtles released at each site and the number of turtles released at each release site are given in Table 1. Turtles were released individually from a slow-moving boat (5 km/hr) at approximately 10 m intervals during the Florida Bay and Homosassa releases. During these releases, divers followed 10 turtles for up to 1 hr to monitor initial behavior after release. To obtain information on the currents affecting these turtles, 12 drift bottles were disbursed during each of the releases at Florida Bay and at Homosassa. These drift bottles contained instructions for reporting their recovery location. A radio current drogue was also released 12 km off Cape Sable,

Florida, during the first Florida Bay release. The movements of this current drogue were then monitored from shore-receiving stations for 3 days before the signal was lost. At Padre Island the turtles were released from the beach.

Thirty-eight of the captive-reared turtles were not released. Twenty-eight were sent to the Miami Seaquarium and 10 to the Galveston SeaArama for continued captive-rearing in order to create a potential breeding stock for captive reproduction and to obtain data on their growth rates for comparisons with growth rates of L. Kempi in the wild.

RESULTS

During the Florida Bay and Homosassa releases, most turtles swam rapidly away from the boat. Divers following turtles noted predominantly near-surface swimming and evasive behavior if turtles were approached closely (within approximately 4 m).

As of December 1980, 61 recaptures had been reported from 2,006 turtles released in 1979 (Table 2). Seven turtles were recaptured twice. The recapture rates are 4.3% for turtles released in the Bay of Florida, 2.0% for turtles released near Homosassa, and 1.8% for those released from Padre Island, with an overall recapture rate of 2.7%. The distance of each recaptured turtle's net movement and its elapsed time in the wild are shown in Table 2. The average net movement from the release site was 714.4 km with a range from 2 to 2,358 km; the average time between release and recapture was 241.4 days with a range from 1 to 625 days; and the average net movement per day was 3.1 km with a range from 0.2 to 11.5 km/day.

Turtles released in Florida Bay were recaptured in an area extending from the Florida Keys, north along the Atlantic coast, to Long Island, New York (Figure 1A). No westerly movements were recorded for turtles released in Florida Bay. Turtles released near Homosassa were recaptured in the Gulf of Mexico as far west as Matagorda Bay, Texas, and in the Atlantic as far north as

Chincoteague, Virginia (Figure 1B). Two turtles from the Padre Island release were recaptured (Figure 1A); both had moved northeast along the Texas coast, one to Palacious, Texas and one to Galveston, Texas.

Drift bottles released in Florida Bay were recovered primarily near the Florida Keys, except for 1 recovery from Boca Raton, Florida (225 km), and two recoveries from Cocoa Beach, Florida (484 km). Drift bottles were recovered in the Florida Keys in as few as 13 days and at Cocoa Beach within 50 days of their release. During the 3 days we tracked the current drogue, it drifted slowly north of Cape Sable, but the signal was lost after a frontal system brought strong northerly winds. Because of the short duration of tracking the current drogue, only the drift bottles were used to evaluate the movements of the turtles following the Florida Bay releases. None of the drift bottles released near Homosassa were recovered.

The turtles were recaptured by a variety of methods as indicated in Table 2. Ten turtles were found alive on beaches: 3 were injured, 2 were partially covered with tar, 1 was reportedly found entangled in a mass of Sargassum, and 4 were on the beach for unknown causes. Two turtles were found dead from unknown causes on beaches. Eighty percent of the recaptured turtles were in good health and were released (Table 2). The tags from 25% of the turtles that were recaptured alive were removed before the turtles were

released. This may have been due to the inscription on the tag which read "Return to Univ. of Florida." We have since changed the tags to read "Write to SEFC, Miami," which will reduce the number of tags removed from subsequent recaptures.

Changes in weight and/or carapace length could be determined for only 33% of the recaptured turtles (Table 3). Weight changes ranged from -2.2 to +11.7 g/day with an average of +5.1 g/day. Straight line carapace length changes ranged from -0.012 to 0.053 cm/day with an average of 0.024 cm/day. The weights and straight line carapace lengths of these turtles were compared with those of the captive-reared turtles at the Miami Seaquarium and the Galveston SeaArama (Figures 2 and 3). The weights and carapace lengths of the Miami Seaquarium reared turtles were significantly greater than those of the recaptured turtles ($P<0.005$, probabilities from t-tests and Wilcoxon tests were combined according to Sokal and Rohlf, 1969, p. 623). Weights and carapace lengths of the turtles reared at the Galveston SeaArama were not recorded until after February 1980. The data recorded after that date show that the Galveston SeaArama turtles also had significantly greater weights and carapace lengths than the recaptured turtles ($P<0.01$, Wilcoxon tests). However, the weights and carapace lengths of the Galveston SeaArama turtles were significantly less than those of the Miami Seaquarium turtles ($P<0.01$,

Wilcoxon tests). The growth rates of the recaptured turtles (carapace length gain/day) were compared to those recorded for wild immature green turtles, Chelonia mydas, (Limpus, 1979; Balazs, 1982) and were found to be significantly greater ($P<0.01$, Wilcoxon tests).

DISCUSSION

The data obtained from the turtle recaptures indicate that a significant portion of the captive-reared L. Kempi have adapted to wild conditions and have dispersed rapidly and widely from their points of release. As would be expected, the location of the release appears to be an important factor affecting the dispersal of the turtles. Each release location resulted in a different dispersal pattern and future release locations should be chosen relative to their effects on the turtles' movements. The following sections contain information obtained from the release and recapture of captive-reared L. Kempi released in 1979.

Florida Bay Releases

The majority (5 of 8) of the drift bottles recovered from the Florida Bay releases were found near the Florida Keys, indicating a net southerly movement of the surface currents following the releases. The numerous turtles recaptured near the Florida Keys suggest that the local currents significantly influenced these turtles movements. The 3 drift bottles that were recovered on the Atlantic coast of the United States apparently drifted southeast through the Florida Keys and into the influence of the Florida Current. Once in the Florida Current these bottles would have been transported northward along the Atlantic

coast (Stommel, 1958) until they moved shoreward in cyclonic eddies of the Gulf Stream or in wind-generated onshore currents (Lee and Mayer, 1977; Ingham, 1979). Similarly, turtles released in the Florida Bay and recovered on the Atlantic coast of the United States may have entered the Gulf Stream and subsequently been carried northward until they moved near shore. These onshore movements could be accomplished by the same methods indicated for the drift bottles as well as by active swimming. There is also the possibility that these turtles moved northward in nearshore waters and were not carried by the Gulf Stream. However, we concur with Carr (1956; 1980) and Witham (1980) that the most probable dispersion mechanism is the Gulf Stream.

From the recovery locations of turtles and drift bottles released in Florida Bay, it appears that ocean currents played a major role in the movements of these turtles. This idea is further substantiated by the total lack of turtle recoveries west or north in the Gulf of Mexico in which turtles would have had to overcome the influence of the net southerly currents following their release.

Homosassa Releases

The recapture locations of turtles released near Homosassa indicate a variety of movement patterns. Many of these turtles apparently moved south from the release sites as far as the Florida Keys. Some of these turtles then

moved north along the Atlantic coast of the United States. These northerly movements were probably influenced by the Gulf Stream, although nearshore paths are also a possibility. Other turtles from the Homosassa releases moved north and west along the Gulf coast as far as Matagorda Bay, Texas. Homosassa released turtles also exhibited large variation in average net movement per day. An example of this for turtles moving north and west from the release site is turtle G2155 (Table 2), which was recaptured 1,384 km from the release site after 315 days in the wild (4.4 km/day), whereas turtle G2146 was recaptured only 80 km from the release site after 434 days in the wild (0.2 km/day).

This wide range in movements suggests that these turtles were more nektonic than the Florida Bay released turtles. This could have been the result of weaker and more variable currents in the Homosassa area, which would have exerted less of an influence on the turtles' movements. The currents near Homosassa are produced by winds and tides (Mofjeld, 1974), whereas the currents of Florida Bay are produced not only by winds and tides but also by eddies formed by the Loop Current that are entrained by the Florida Current near the Florida Keys (Maul, 1975).

Padre Island Releases

The two turtles recaptured from the Padre Island National Seashore release were both found northeast of the release area along the Texas coast. Considering the long periods these turtles had been in the wild (309 and 392 days) they were relatively short distances away from the release site (322 and 161 km). The seasonal reversal of currents along the Texas coast (Temple and Martin, 1979) could have been responsible for these short net movements if the current was a major factor controlling the turtles' movements. Additionally, movements into the Texas bay system could also have been responsible for these short net movements. Turtle G2313 was recaptured in a bay near Palacious. While in the bays, turtles would not be exposed to the displacement effects of longshore and offshore currents. These turtles were also larger than the turtles that were released at the other release sites and should have had better swimming abilities.

General Characteristics of L. Kempi Movements

The movements of the recaptured turtles and the wide geographical range from which immature L. Kempi have been reported in the past, suggest that large variations exist in the movements of immature L. Kempi. This information also suggests that the early life history of this species represents a time when these turtles disperse throughout the Gulf of Mexico and the North Atlantic. Our data also

support Carr's theory that strong ocean currents such as the Gulf Stream act as dispersal mechanisms for L. Kempi (Carr, 1956, 1980). This also appears to be the case for Chelonia mydas (Witham, 1980). This idea is further supported by the distribution of wild L. Kempi, since immature individuals have been reported from various areas of the Atlantic coasts of North America and Europe (Carr, 1956, 1980; Pritchard and Marquez, 1973). Nevertheless, the effects of the Gulf Stream appear to be temporary (at least for some turtles), because the recaptured turtles apparently moved out of the Gulf Stream and into nearshore waters.

In slower-moving waters (i.e. Homosassa area), the L. Kempi exhibited a variety of movements. This suggests that in areas without powerful currents, L. Kempi of approximately 0.5 to 1.0 kg are capable of making a transition from a planktonic animal, as very young sea turtles are assumed to be (Carr, 1980; Witham, 1980), into a necktonic animal. Thus these turtles would appear to be at the end of their so called "lost year" (Carr, 1980; Witham, 1980), if they are in areas without powerful currents. Further evidence for this was shown by four turtles (G0074, G0460, G0904, G2831, Table 2) that were recaptured a second time in the same general area as their initial recapture, after intervals ranging from 14 to 31 days. These four turtles as well as at least 12 of the other recaptured turtles were found in or near esturaries, suggesting not

only a habitat preference, but also the ability to remain in such areas once they are reached. Unfortunately, if a preference for estuarine environments exists, it may increase the chance of being captured, since these areas are heavily fished by man. Most of the fishing and shrimping techniques used in estuaries can result in the capture of L. Kempi (Table 2). The large number of recaptures in estuarine areas could also be the result of the greater fishing and shrimping pressure in those areas.

Growth

Eighty-five percent of the turtles listed in Table 3 showed increases in weight or carapace length. Eleven of the 13 turtles weighed after recapture had at least doubled in weight. The growth rates of these L. Kempi were greater than the growth rates recorded for C. mydas. Balazs (1982) suggested that the differences he recorded in the growth rates of immature C. mydas were a function of each turtle's diet. Similarly, the carnivorous feeding habits of L. Kempi (Pritchard and Marquez, 1973) may explain the significantly greater growth rates of the recaptured L. Kempi compared to those of herbivorous C. mydas. However, it is obvious that other factors could also be responsible (i.e. genetic factors, temperature, food availability). Growth rates greater than those of the recaptured turtles are possible for L. Kempi as shown by the Miami Seaquarium and the Galveston SeaArama-reared turtles (Figures 2 and 3). Data

from future recaptures will be needed to determine if these higher growth rates occur in the wild.

The wide ranges in growth rates listed in Table 3 suggest that L. Kempi growth rates are quite variable. This is further substantiated by the significant differences in the weights and carapace lengths of the Miami Seaquarium turtles compared to those of the Galveston SeaArama turtles (Figures 2 and 3).

Adaptation to the Wild

Although unnatural behavior may be expected for captive-reared turtles (Pritchard, 1980), the shortage of information on the behavior of wild L. Kempi prevents any comparison. However, wild L. Kempi have been reported from almost all areas where the captive-reared turtles were recaptured (Carr, 1956, 1980; Pritchard and Marquez, 1973). This is an encouraging indication that captive-reared L. Kempi are behaving normally. The growth of the recaptured turtles (Table 3) indicates that they have adapted to life in the wild. Additionally, of the 54 turtles recaptured, 80% were healthy and were released. Thus the above information suggests that captive-reared L. Kempi can adapt to the wild.

ACKNOWLEDGEMENTS

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FOOTNOTES

1. This study was made possible through permits from the Mexican Government (Permit Nos. 1978-ABC-IV-0751, 27611-8786 and 1979-ABC-IV-1258). This study is a contribution from the Southeast Fisheries Center, Galveston Laboratory, National Marine Fisheries Service, NOAA.

2. Current address: NOAA National Sea Grant Program, 6010 Executive Blvd., Rockville, MD 20852.

3. Current address: Department of Biology, Texas A&M University, College Station, TX 77843.

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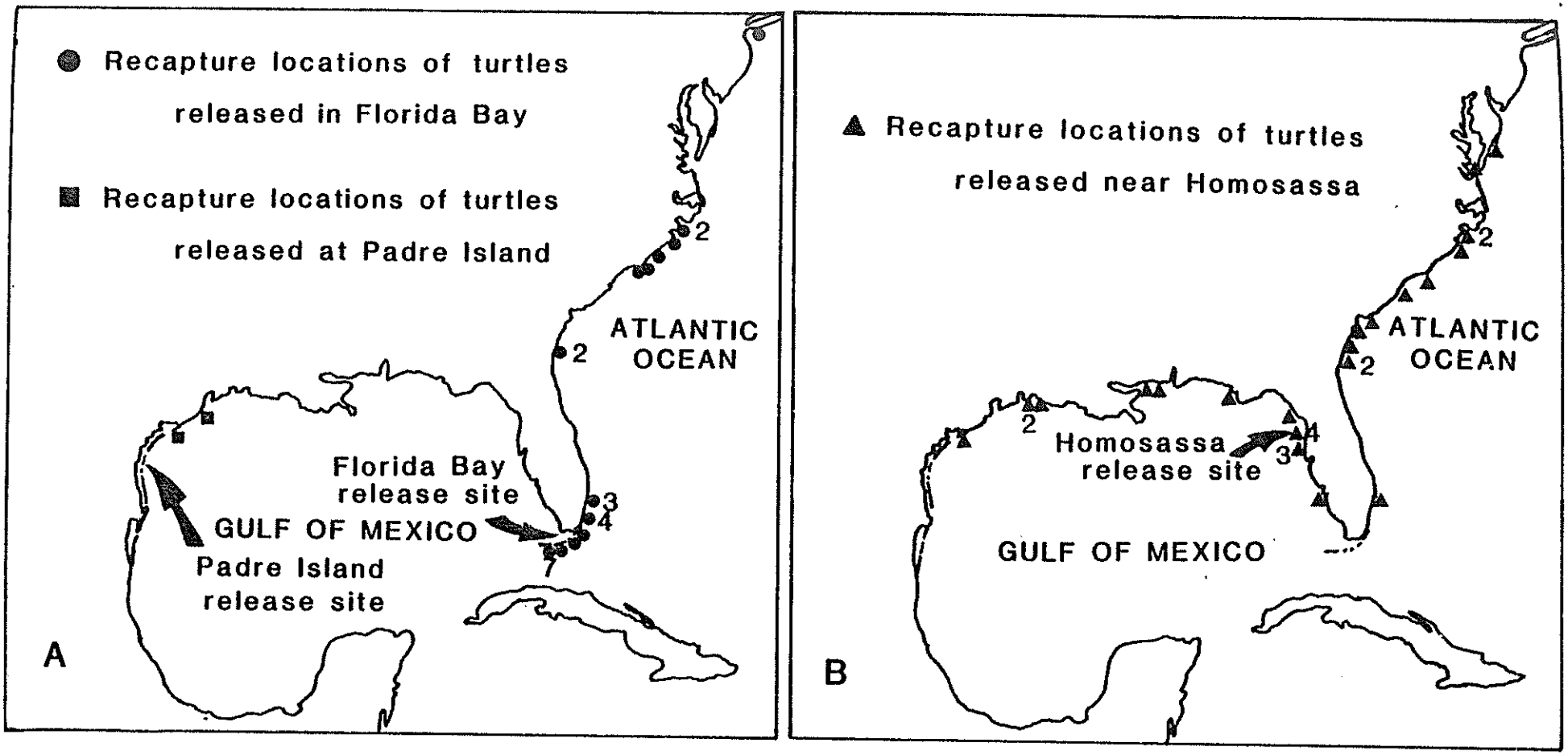
Figure Legends

Figure 1. Release sites and recapture locations of Lepidochelys Kempi released in the Gulf of Mexico during 1979. In locations where more than one recapture occurred, the number adjacent to those locations indicates the number of recaptures.

Figure 2. Weight versus age plot for Lepidochelys Kempi under captive and wild conditions. Points representing the weights of the Miami Seaquarium and the Galveston SeaArama turtles are mean values, whereas the triangles representing the weights of recaptured turtles are individual values.

Figure 3. Length versus age plot for Lepidochelys Kempi under captive and wild conditions. Points representing the lengths of the Miami Seaquarium and the Galveston SeaArama turtles are mean values, whereas the triangles representing the lengths of recaptured turtles are individual values. All length values indicate straight line carapace lengths.


Recapture locations of turtles released in Florida Bay
Recapture locations of turtles released at Padre Island
ATLANTIC OCEAN
Florida Bay release site
GULF OF MEXICO
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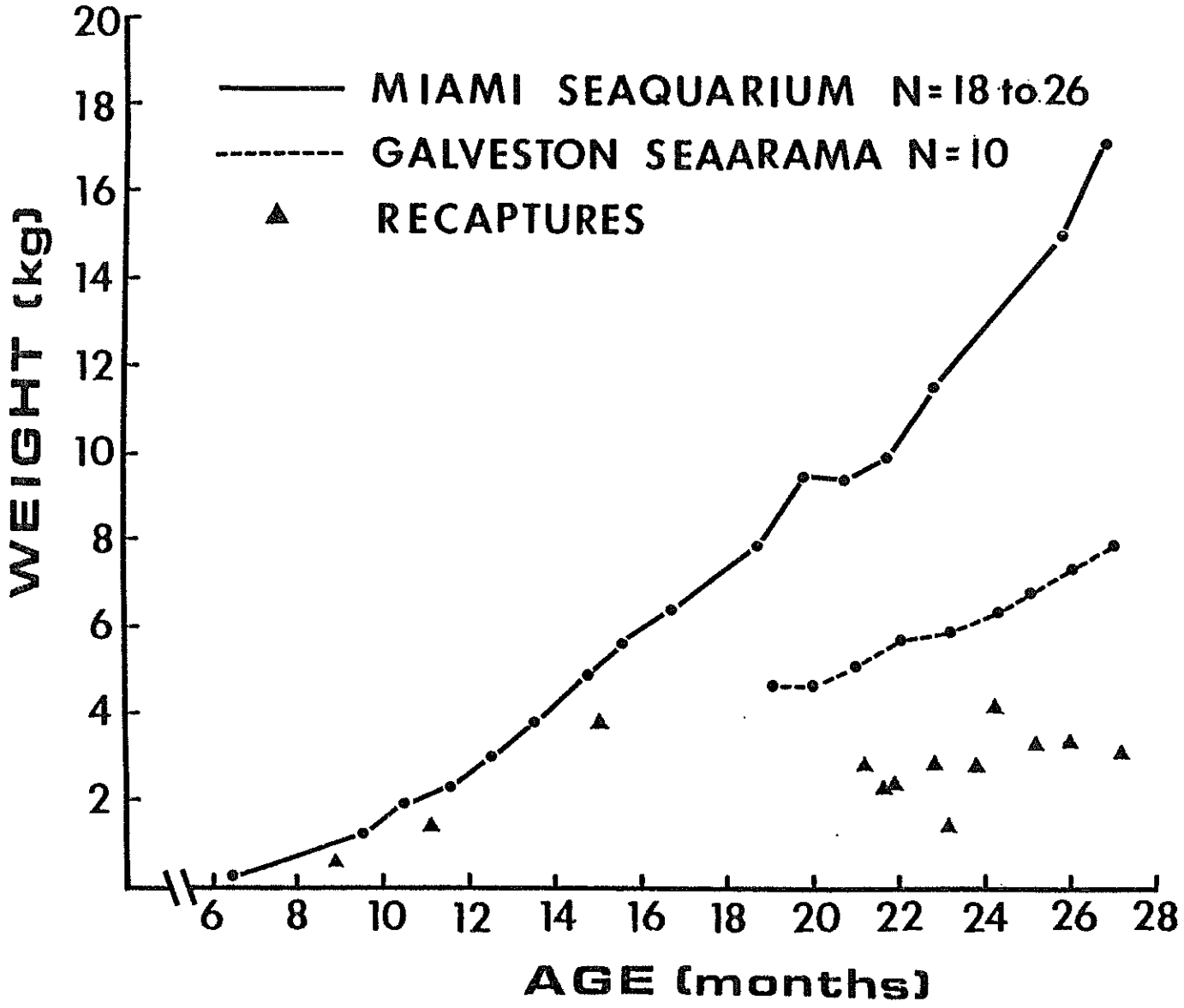
A
Recapture locations of turtles released near Homosassa
ATLANTIC OCEAN
Homosassa release site
GULF OF MEXICO
B


MIAMI SEAQUARIUM N=18 to 26
GALVESTON SEAARAMA N=10
RECAPTURES
WEIGHT (kg)
20
18
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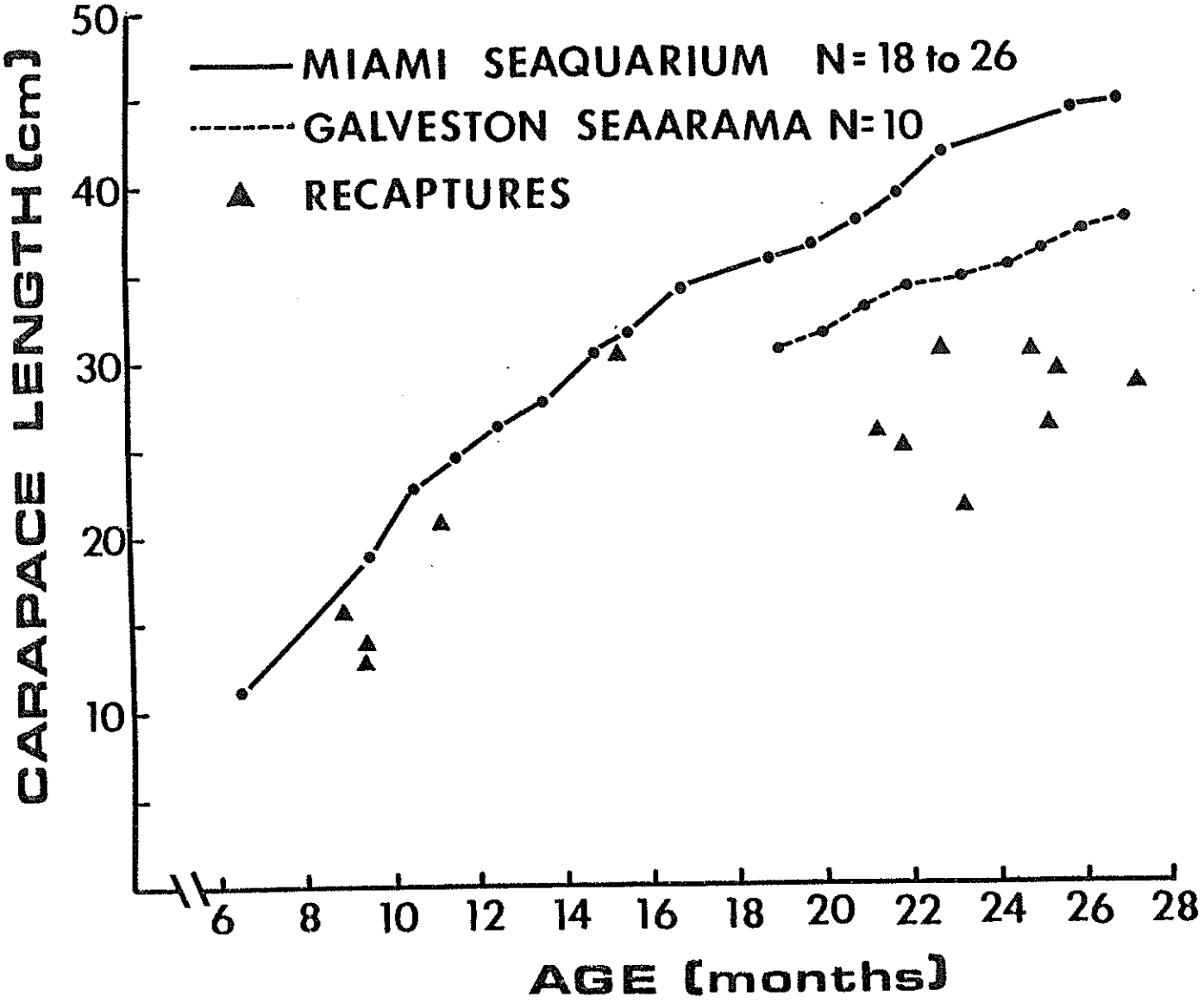
AGE (months)


MIAMI SEAQUARIUM N= 18 to 26
GALVESTON SEAARAMA N= 10
RECAPTURES
CARAPACE LENGTH (cm)
50
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8
10
12
14
16
18
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22
24
26
28
AGE (months)

Table 1: Kemp's Ridley Releases in 1979.

Date	Location of release	Number of turtles	Range of tag numbers	Average weight (g)	Range of weights (g)	Average length (cm)	Range of lengths (cm)
	Florida Bay, FL		G0027-G0581	576	240-1170	14.5	10.8-19.0
2/22/79	East Cape Sable	51					
2/22/79	Sandy Key Basin	159					
2/28/79	East Cape Sable	162					
3/5/79	Sandy Key Basin	174					
	Homosassa, FL		G0600-G2986 F4002-F4035	613	70-1,340	14.9	8.1-20.5
5/8/79	20 km offshore	749					
5/9/79	5 km offshore	622					
	Padre Island, TX		F4006-F4128 G0985-G2999	1,045	370-2,390	19.6	13.1-25.6
7/7/79	Padre Island National Seashore	109					

Table 2: Recaptures of captive-reared Kemp's Ridleys that were Released in 1979.

Tag	Release Location	Release Date	Recapture Location	Recapture Date	Distance from release location	Elapsed time since release (days)	Method of capture	Condition of turtle	Tag removal
G0032	Sandy Key	2/22	Marathon, FL	4/12/79	40	49	Dip net	I	N
G0036	Sandy Key	2/22	Delray, FL	3/15/79	241	21	AOB	I	N
G0044	East Cape	2/22	Swansboro, NC	7/9/80	1,344	493	cast net	H	N
G0045	Sandy Key	2/22	Core Sound, NC	11/25/80	1,452	625	gill net	H	N
G0054	Sandy Key	2/22	Big Pine Key, FL	4/21/79	48	59	AOB	H	N
G0073	Sandy Key	2/22	Bahia Honda, FL	3/8/79	48	14	dip net	H	NA
G0074	Sandy Key	2/22	Big Pine Key, FL	3/19/79/79	48	25	AOB	H	N
G0074	Sandy Key	2/22	Big Pine Key, FL	4/19/79	48	79	AOB	H	N
G0077	Sandy Key	2/22	Bahia Honda, FL	3/26/79	48	32	dip net	H	NA
G0104	Sandy Key	2/22	Miami, FL	4/9/79	153	47	NA	NA	NA
G0123	Sandy Key	2/22	Pompano, FL	4/30/79	225	67	dip net	H	N
G0190	Sandy Key	2/22	Cape Fear, NC	8/9/80	1,223	526	gill net	H	N
G0254	East Cape	2/28	Key Biscayne, FL	3/26/79	153	26	AOB	H	Y
G0257	East Cape	2/28	Key Largo, FL	4/2/79	89	33	by hand	H	N
G0366	Sandy Key	3/5	Biscayne Bay, FL	4/25/79	153	52	NA	H	N
G0366	Sandy Key	3/5	Biscayne Bay, FL	4/26/79	154	53	NA	H	N
G0370	Sandy Key	1/22	Carolina Beach, NC	11/7/80	1,257	611	shrimp trawl	H	N
G0402	East Cape	2/28	Big Pine Key, FL	3/31/79	48	31	AOB	H	N
G0409	East Cape	2/28	Pamlico Sound, NC	7/29/80	1,457	509	shrimp trawl	H	Y
G0460	East Cape	2/28	Jekyll Island, GA	9/25/79	761	201	NA	H	N
G0460	East Cape	2/28	Jekyll Island, GA	10/21/79	761	227	NA	H	Y
G0467	East Cape	2/28	Miami, FL	4/22/79	161	54	AOB	H	N
G0501	East Cape	2/28	Tavernier, FL	4/25/79	64	56	dip net	H	Y
G0518	Sandy Key	3/5	Long Island, NY	7/25/80	1,846	500	DOB	H	Y
G0520	Sandy Key	3/5	Big Pine Key, FL	3/22/79	48	17	AOB	H	N
G0561	Sandy Key	3/5	Boca Chica, FL	4/2/79	80	28	DOB	D	Y
G0580	Sandy Key	3/5	Pamlico Sound, NC	7/7/80	1,460	482	gill net	H	N
G0581	East Cape	2/28	Fort Lauderdale, FL	3/26/79	209	31	AOB	I	N
G0618	Homosassa	5/8	Gulfport, MS	6/18/79	604	51	NA	H	N
G0682	Homossasa	5/8	Dauphin Island, AL	7/21/80	499	421	shrimp trawl	D	Y
G0749	Homasassa	5/8	Fort Lauderdale, FL	7/14/79	660	65	NA	H	N
G0856	Homosassa	5/8	St. Joseph, FL	6/17/80	264	406	shrimp trawl	H	Y
G0904	Homosassa	5/8	Colonel Island, GA	8/25/80	1,223	475	NA	H	N
G0904	Homosassa	5/8	Colonel Island, GA	9/8/80	1,223	489	NA	H	N
G0914	Homosassa	5/8	Hampstead Bay, NC	7/9/80	1,661	429	gill net	H	N
G0914	Homosassa	5/8	Beaufort, NC	8/20/80	1,851	470	NA	H	N
G0945	Homosassa	5/8	Homosassa, FL	5/9/79	2	1	by hand	H	N
G2057	Homosassa	5/8	Caswell Beach, NC	6/13/80	1,674	402	cast net	H	Y
G2123	Homosassa	5/8	Yorktown, VA	7/1/80	2,253	420	cast net	H	N
G2146	Homosassa	5/8	Fort Meyers, FL	1/5/80	266	242	hook and line	H	Y
G2155	Homosassa	5/8	Matagorda Bay, TX	3/18/80	1,384	315	shrimp trawl	H	Y
G2159	Homosassa	5/8	Chincoteague, VA	9/15/80	2,358	496	shrimp trawl	H	N
G2324	Homosassa	5/8	Homosassa, FL	5/9/79	2	1	by hand	H	N
G2330	Homosassa	5/8	Clearwater, FL	5/27/79	31	19	by hand	H	Y

Table 2: (Continued)

Tag	Release Location	Release Date	Recapture Location	Recapture Date	Distance from release location (days)	Elapsed time since release	Method of capture	Condition of turtle	Tag removal
G2385	Homosassa	5/8	Holly Beach, LA	4/24/80	1,207	352	gill net	H	N
G2385	Homosassa	5/8	Johnson Bayou, LA	6/22/80	1,225	411	NA	H	Y
G2406	Homosassa	5/8	Ocracoke, NC	10/22/80	1,931	533	hook and line	H	N
G2411	Homosassa	5/8	Homosassa, FL	5/9/79	2	1	by hand	H	N
G2465	Homosassa	5/8	St. Kathetrines Is., GA	8/17/80	1,287	467	shrimp trawl	D	Y
G2477	Homosassa	5/8	Homosassa, FL	5/9/79	2	1	by hand	H	N
G2555	Homosassa	5/8	Huntington Beach, SC	6/10/80	1,561	390	AOB	H	N
G2667	Homosassa	5/8	Pamlico Sound,NC	6/4/80	1,947	393	shrimp trawl	NA	Y
G2697	Homosassa	5/8	Edisto Beach, SC	6/23/80	1,400	412	hook and line	H	N
G2702	Homosassa	5/8	Charleston, SC	6/7/80	1,456	396	shrimp trawl	NA	N
G2717	Homosassa	5/8	Weeki Wachi, FL	6/25/79	64	48	dip net	H	N
G2793	Homosassa	5/8	Horseshoe Beach, FL	7/25/80	80	434	gill net	D	Y
G2831	Homosassa	5/8	New Port Richey, FL	6/19/79	68	42	AOB	H	N
G2831	Homosassa	5/8	New Port Richey, FL	7/9/79	68	42	dip net	H	Y
G2983	Homosassa	5/8	Cameron, LA	5/4/80	1,142	361	shrimp trawl	H	NA
G0985	Padre Island	7/7	Galveston, TX	5/11/80	322	309	hook and line	H	N
G2313	Padre Island	7/7	Palacious, TX	8/3/80	161	392	hook and line	H	Y

AOB = alive on the beach, DOB = dead on the beach, NA = data not available, I = injured, H = healthy, D = dead, N = no, Y = ye

Table 3: Weight and Length Gains of Kemp's Ridleys Following Their Release.

Tag	Elapsed time in the wild (days)	Release weight (g)	Capture weight (g)	Average weight gain per day (g/day)	Release length (cm)	Capture length (cm)	Average length gain per day (cm/day)
G0104	47	660	554	-2.2	15.2	15.5	0.006
G0190	526	725	NA	NA	15.4	30.5	0.028
G0366	52	510	NA	NA	14.3	13.9	-0.012
G0460	227	600	3,855	11.7	15.5	30.4	0.053
G0467	54	410	NA	NA	13.0	12.7	-0.005
G0580	482	370	2,718	4.4	13.0	NA	NA
G0618	51	1,080	1,474	7.7	18.4	21.0	0.050
G0904	475	900	NA	NA	17.0	29.2	0.026
G0914	470	720	3,311	5.5	15.2	26.3	0.023
G0985	309	840	2,450	5.2	17.2	25.0	0.025
G2057	402	580	2,945	5.9	14.9	NA	NA
G2159	496	710	3,400	5.4	15.4	NA	NA
G2385	352	600	2,700	5.9	15.4	26.0	0.030
G2406	533	470	3,058	4.8	14.0	28.5	0.023
G2667	393	570	NA	NA	15.0	30.5	0.039
G2697	412	580	1,400	2.0	13.8	21.5	0.018
G2793	434	800	4,080	7.6	16.7	NA	NA
G2983	361	550	1,359	2.2	14.1	NA	NA
Total average gain/day				5.1			0.024

NA = data not available